FETC SUCCESS
U.S. Department of Energy
Federal Energy Technology Center

CLEAN AFFORDABLE POWER

- [x] fossil energy
- [ ] environmental
- [x] energy efficiency
- [ ] other

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Hot Gas Filter System Significantly Increases Availability of the Cleanest Coal Based Power System

States Impacted:
In addition to coal states, the following states have filter manufactures and would benefit accordingly: New York, Florida, California, Minnesota, Delaware, Utah, Illinois, and Virginia.

Benefit Areas:
Energy Security, Cost Savings, Reliable Energy.

Participants:
Pall Corp., US Filter, 3M Corp., Oak Ridge National Laboratory, McDermott, and Dynegy Power.

FETC Contact:

Rich Dennis**
Office: (304) 285-4515
E-Mail:rdennis@fetc.doe.gov

MAIL ADDRESS:

* U.S. Department of Energy
P.O. Box 10940
626 Cochrans Mill Road
Pittsburgh, PA 15236-0940

**U.S. Department of Energy
P.O. Box 880
3610 Collins Ferry Road
Morgantown, WV 26507-0880

WEBSITE:
www.fetc.doe.gov

Description

America's, if not the world's, cleanest coal based power system is located in Terre Haute, Indiana. This 265 MW electric power plant is known as the Wabash River Coal Gasification Repowering Project and has been supported, in part, through the DOE's Clean Coal Technology Program. This power system is based on Dynegy's Power Corporation entrained-flow gasification technology. In this power system coal is mixed with pure oxygen and gasified at high temperature creating a coal-derived gas. This gas is then cleaned of sulfur and particulates producing a fuel that is similar to a natural gas. This gas is then burned in a conventional gas turbine to generate electricity.

Success in the cleanup step of the gas stream, by removing sulfur and particulates from the coal derived gas, is essential to the success of the power system. The sulfur cleanup process is based on fully developed technology and has been trouble free. The particulate removal process, however, had caused availability problems and now is being successfully developed. Over the past three years, researchers have worked to improve the performance and availability of the hot gas filter system. In 1996 difficulties in the hot gas filter system made up more than 39% of the total plant downtime. Now through the efforts of DOE-FETC, National Laboratories, Dynegy Energy, and other private industry, down time due to the hot gas filter system has been reduced to below 6 %.

Goals

The Government-Industry team working on this filter development has the following goals: 1) no lost power plant availability due to the hot gas filter, 2) 10,000 hours of filter element life, and 3) 3,300 hours between filter vessel entries. The greater share of these goals will be obtained through the successful development of candle filter elements for the Dynegy Power process.

Tangible Benefits

National: This project will help ensure that America continues improving on environmental quality and affordability of our electric supply. Inexpensive and clean electric power will insure that our domestic industry remains competitive in the world market creating domestic jobs.

Regional: All coal producing regions of the US may benefit. Filter manufacturers competing for use in these advanced coal based power systems would benefit.